

AMENDMENTS TO THE CLAIMS

1. - 2. (canceled)

3. (currently amended) A coaxial resonator comprising:
an inner conductor formed on an outer surface of a columnar element;
a dielectric element having a hole formed therein, the columnar element being disposed in the hole;

an outer conductor formed on an outer surface of the dielectric element; and
a non-conducting element disposed between the columnar element and the dielectric element,

wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated to form lines, each line comprising a dielectric layer and an adjacent conductor layer of the inner conductor,

wherein a thickness of the conductor layers and a thickness of the dielectric layers ~~are based on the non-conducting element~~ determined by phase constants of the lines, the phase constants of the lines being substantially equal, and

wherein the non-conducting element is air.

4. (previously presented) The coaxial resonator according to Claim 3, wherein the inner conductor comprises a plurality of helical lines.

5. (canceled)

6. (currently amended) The coaxial resonator according to Claim 3 or 4, wherein the phase constants of the lines for the conductor layers in the inner conductor are substantially equal to phase constants of lines for the conductor layers in the inner conductor ~~and the outer conductor.~~

7. (canceled)

8. (currently amended) A filter comprising:

a plurality of coaxial resonators, each coaxial resonator comprising:

an inner conductor formed on an outer surface of a columnar element, wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated to form lines, each line comprising a dielectric layer and an adjacent conductor layer of the inner conductor;

a dielectric element having a hole formed therein, the columnar element being disposed in the hole;

an outer conductor formed on an outer surface of the dielectric element; and

a non-conducting element disposed between the columnar element and the dielectric element, wherein a thickness of the conductor layers and a thickness of the dielectric layers are ~~based on the non-conducting element~~ determined by phase constants of the lines, the phase constants of the lines being substantially equal, and wherein the non-conducting element is air; and

an input/output device coupled to a predetermined coaxial resonator of the plurality of coaxial resonators.

9. (canceled)

10. (currently amended) A duplexer comprising:

a transmission filter disposed between a transmission signal input port and a transmission/reception signal input/output port; and

a reception filter disposed between the transmission/reception signal input/output port and a reception signal output port,

wherein at least one of the transmission filter and the reception filter includes a plurality of coaxial resonators, each coaxial resonator comprising:

an inner conductor formed on an outer surface of a columnar element, wherein the inner conductor has a multi-layer electrode structure in which conductor layers and

dielectric layers are alternately laminated to form lines, each line comprising a dielectric layer and an adjacent conductor layer of the inner conductor;

a dielectric element having a hole formed therein, the columnar element being disposed in the hole;

an outer conductor formed on an outer surface of the dielectric element; and

a non-conducting element disposed between the columnar element and the dielectric element, wherein a thickness of the conductor layers and a thickness of the dielectric layers are ~~based on the non-conducting element~~ determined by phase constants of the lines, the phase constants of the lines being substantially equal, and wherein the non-conducting element is air; and

an input/output device coupled to a predetermined coaxial resonator of the plurality of coaxial resonators, the input/output device being coupled to a corresponding one of the ports.

11. (currently amended) A communication device comprising:

a high-frequency circuit comprising a transmission circuit and a reception circuit;

and

a duplexer comprising:

a transmission filter disposed between a transmission signal input port and a transmission/reception signal input/output port; and

a reception filter disposed between the transmission/reception signal input/output port and a reception signal output port,

wherein at least one of the transmission filter and the reception filter includes a plurality of coaxial resonators, each coaxial resonator comprising:

an inner conductor formed on an outer surface of a columnar element, wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated to form lines, each line comprising a dielectric layer and an adjacent conductor layer of the inner conductor;

a dielectric element having a hole formed therein, the columnar element being disposed in the hole;

an outer conductor formed on an outer surface of the dielectric element; and

a non-conducting element disposed between the columnar element and the dielectric element, wherein a thickness of the conductor layers and a thickness of the dielectric layers are ~~based on the non-conducting element~~ determined by phase constants of the lines, the phase constants of the lines being substantially equal, and wherein the non-conducting element is air; and

an input/output device coupled to a predetermined coaxial resonator of the plurality of coaxial resonators and coupled to a corresponding one of the ports.

12. (currently amended) A communication device comprising:

a high-frequency circuit comprising at least one of a transmission circuit and a reception circuit, the high-frequency circuit comprising:

a plurality of coaxial resonators, each coaxial resonator comprising:

an inner conductor formed on an outer surface of a columnar element, wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated to form lines, each line comprising a dielectric layer and an adjacent conductor layer of the inner conductor;

a dielectric element having a hole formed therein, the columnar element being disposed in the hole;

an outer conductor formed on an outer surface of the dielectric element; and

a non-conducting element disposed between the columnar element and the dielectric element, wherein a thickness of the conductor layers and a thickness of the dielectric layers are ~~based on the non-conducting element~~ determined by phase constants of the lines, the phase constants of the lines being substantially equal, and wherein the non-conducting element is air; and

an input/output device coupled to a predetermined coaxial resonator of the plurality of coaxial resonators.

13-21. (canceled)

22. (currently amended) A coaxial resonator comprising:

an inner conductor formed on an outer surface of a columnar element;

a dielectric element having a hole formed therein, the columnar element being disposed in the hole;

an outer conductor formed on an outer surface of the dielectric element; and

a non-conducting element disposed between the columnar element and the dielectric element,

wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated to form lines, each line comprising a dielectric layer and an adjacent conductor layer of the inner conductor,

wherein a thickness of the conductor layers and a thickness of the dielectric layers are ~~based on the non-conducting element~~ determined by phase constants of the lines, the phase constants of the lines being substantially equal, and

wherein the inner conductor is formed separate from the dielectric element and inserted into the hole of the dielectric element.